

Surface Water Quality Assessment of River Kali UP, With Special Emphasis to Non-Point Source Pollution

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ABSTRACT

Non-point source pollution continues to be an important environmental and water quality management problem. Numerous studies aimed at understanding the processes controlling non-point source pollutant (NPS) concentration, fluxes in the river systems and the quantification of the annual NPS loads to the rivers and streams have been accomplished in the past. However, in India, very little work has been done to estimate the non-point source pollution in streams.

In the present study, an extensive water quality survey has been employed to estimate the inflow of nutrients (nitrate as NO_3 and phosphate as o-PO_4) from non-point sources and point sources for one annual cycle in different reaches of River Kali, western Uttar Pradesh, India. A criteria has been evolved to compute the NPS load from each sub-basins lying in different reaches of River Kali. The governing equation developed is based on the conservation of mass and reaction kinetics phenomena. Field surveys have been accomplished in the study area to collect the water samples, to obtain field information from the farmers and State Govt. departments. Water samples have been collected from sixteen river reaches on monthly basis for one annual cycle to analyze to NO_3 and o-PO_4 inflow to the River Kali from external sources. The computed loads at any section obtained from the predictive equation have been compared with the values observed in the field. The performance of developed equation has been evaluated using percentage error estimation and correlation statistics.

Remote sensing (RS) and geographical information system (GIS) has also been used to develop correlation between basin characteristics and non-point source loads.